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DIVISION OF
OIL GAS & MINING

April 22, 1991

Mr. Frank Wicks
Vice President & General Manager
Barrick Mercur Gold Mine
P.O. Box 838
Tooele, Utah 84074

RE: March 11, 1991 Response to Comments
Ground Water Model Work Plan, Request
for Extension of Time, received March 19,
1991, and April 4, 1991 Proposed Ground
Water Modeling Schedule; Ground Water
Quality Discharge Permit No. UGW450001.

Dear Mr. Wicks:

We have reviewed your response to our March 5, 1991 Notice of Deficiency for the Ground Water Model Work Plan, your request for an extension of the deadline imposed by the December 18, 1990 Conditional Approval, and a proposed schedule for the ground water modeling by Dames & Moore, referenced above. In addition we have met with both your staff and your consultant in a meeting of April 1, 1991 to discuss the unresolved issues for the ground water model.

After consideration of your submittals and discussions with both your staff and consultant, we agree that the Dump 3 site can only be adequately modeled with a three-dimensional code capable of integrating both unsaturated and saturated ground water flow conditions. As explained by your consultant the use of a contaminant transport code would be helpful to trace the path of the simulated leakage from the dump leach to the water table and from thence down the simulated local hydraulic gradient. This transport would be only under advective conditions; i.e. no dispersion, diffusion, retardation or decay effects would be considered.

After a review of available ground water flow and contaminant transport codes available, we are posed with a dilemma, in that the only codes capable of such a complex simulation are proprietary, including the TARGET model by Dames & Moore. As discussed in our April 1, 1991 meeting, the proprietary nature of TARGET can be overcome, in that Dames & Moore is willing to provide the Executive Secretary with a temporary license for the TARGET model to allow our staff to conduct sensitivity analysis for confirmation purposes. However, the larger

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problem still remains in that the TARGET code has not been tested and verified by the applicable technical community and published literature.

We have reviewed the documentation in the March 11, 1991 submittal and have determined that the summary comparisons conducted by Dames & Moore personnel to verify the TARGET code against several analytical solutions and various ground water problems indicate the code adequately simulates the subject problems as conceptualized and tested. We have also been in telephone contact with the Southwest Florida Water Management District (SWFWMG), referred to us by Dames & Moore as an public agency that had recently tested TARGET with several other ground water flow and transport codes. Staff at SWFWMG informed us that TARGET had been compared against four other codes to simulate a sea water intrusion problem. Three of the comparison codes were well documented and tested public domain models (SUTRA, HST3D, and SWITCHA). As described by the SWFWMD staff, the comparisons showed that all four models, including TARGET, predicted similar results. Based on this verbal report it appears that the TARGET code may be feasible for use in simulating ground water flow and transport for the subject problems. Though we are optimistic at this point, any blanket authorization of the TARGET code would only be extended after review of the published SWFWMD report, or other technical publication, completed by an independent party, which documents TARGET's performance.

Consequently, we concur in the use of the TARGET ground water and contaminant transport model for establishing a satisfactory ground water monitoring system at Barrick Dump Leach No. 3 site, based on the following conditions:

1. Receipt of any information by the Executive Secretary at any future date which may make the use or application of the TARGET model to the Dump Leach No. 3 site suspect or invalid shall render any decisions based on the model null and void.
2. Any and all unresolved issues outlined in our March 5, 1991 Notice of Deficiency will be resolved by Barrick during development of the models. This includes, but is not limited to:
 - a) Modeling of local recharge beneath the dump leach.
 - b) Scale of the domain and location of the constant flux boundaries of the three-dimensional model.
3. Sensitivity analysis will be conducted by Barrick in order to overcome any and all data uncertainty, as deemed necessary by the Executive Secretary. The selection of which solution(s) is most probable or representative from the resultant suite of possible solutions is the sole discretion of the Executive Secretary.

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4. Barrick will calibrate the model to the hydrographs of the monitoring wells and temporal variation in local recharge, and reevaluate the results of the model at some future date when sufficient hydrograph information is available, as directed by the Executive Secretary. This calibration work will be completed no later than at the time of permit renewal.
5. This conditional acceptance is only applicable to the Barrick Dump Leach No. 3 facility, and in no way represents unconditional approval, sanction, or endorsement of the TARGET model or code by the Executive Secretary for any other facility or purpose.

We have also reviewed your March 15, 1991 request for an extension of time to the compliance schedule required by the December 18, 1991 Conditional Approval and an April 4, 1991 proposed schedule for ground water modeling submitted by Dames & Moore on your behalf. In general terms we find the schedule acceptable. However, at this time we have elected to defer any approval of the extension until June 15, 1991, whereupon the decision to approve an extension of time will be made contingent on Barrick's performance on all the outstanding issues from the December 18, 1990 Conditional Approval.

These issues include:

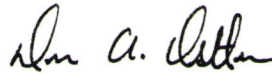
1. Resolution of outstanding issues on the Joint and Fracture Characterization Study.
2. Satisfactory resolution of all outstanding issues regarding the Dump 3 Flow Balance and Head Control Plan, and satisfactory implementation of said monitoring.
3. Satisfactory progress and compliance with the April 4, 1991 schedule for ground water modeling.
4. Satisfactory resolution of the presence of fluid in the upper leak detection system of Dump Leach No. 3.

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If you have any questions or comments, please contact Loren Morton at 538-6146. We appreciate your continued cooperation.

Sincerely,

Utah Water Pollution Control Committee



Don A. Ostler, P.E.
Executive Secretary

cc: George Condrat, Dames & Moore
Wayne Hedberg, DOGM
Myron Bateman, Tooele County Health Dept.

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